thermal expansion of water between 0° and 40°. To this problem Regnault's method of measuring the thermal expansion of mercury is applied, with suitable modifications. Elaborate precautions are taken to secure that the temperature of each of the two balancing columns should be the same throughout, but the difficulty of the measurement lies in determining the difference in level of the ends of these two columns, and Dr. Thiessen's apparatus designed for this purpose proved in his hands most successful. It may perhaps be useful to give the table of the density of water at various temperatures under atmospheric pressure, assuming the density at 4° C. to be unity.

t.	Density according to Thiessen.	Difference from Chappuis' values.
0°	·9998676	− 2
10	·9997270	+ 2
15	·9991263	+ 22
20	·9982299	+ 29
25	·9970715	+ 11
30	·9956736	+ 19
35	·9940576	+ 47
40	·9922418	+ 43

In the third column are given the differences between Chappuis' values found in 1897 and those obtained by Thiessen.

It will be observed that throughout they are very small; indeed a closer examination shows that from 0° to 12° the differences only amount to one or two units in the seventh figure. Chappuis' measurements, it may be mentioned, were made by aid of a dilatometer of platinum-iridium, and involve a knowledge of the thermal expansion of that substance.

In a second paper Dr. Thiessen applies to the same apparatus for measuring the difference of height of two columns to the determination of the pressure of saturated water vapour. The value found for this quantity at 0° C. is 4·579 mm. of mercury, with a probable error of ·001 mm.

Another paper which should have many readers is that by Profs. Jæger and Kahle, on the mercury standards of resistance. This is a continuation of Dr. Jæger's paper in the second volume of the *Transactions* of the Reichsanstalt. A very full description is given of the work of constructing the standards and determining by calibration their resistance in terms of the ohm as defined legally, viz., the resistance of a column of mercury at 0° C., 106·3 centimetres in length and 14·4521 grammes in mass. The tubes were then compared electrically among themselves, and also with the manganin standards of the Reichsanstalt. For this purpose four manganin coils are used. The mean value of the resistance of these four coils at 18° C., as determined from the original tubes calibrated in 1892, was found to be 1·004582, and from the new tubes calibrated in 1897, 1·004578. Changes amounting to about ·00002 were observed in some of the manganin coils during the period of observation.

Dr. Kohlrausch himself contributes a very important paper on the resistance of aqueous solutions of the chlorides and nitrates of the alkalis.

This is followed by a comparison of thermometers made of various kinds of glass, with a further intercomparison of the standard thermometers of the institution.

As regards the depression of the freezing point, the former observations of Wiebe and others are confirmed; it increases for the older kinds of glass, according to a more or less parabolic law, with the temperature to which the thermometer has been raised; while, as before, it is clearly shown that the depression is much greater in glasses containing both soda and potash than it is in glasses which contain either soda or potash only.

Perhaps, however, the most striking results in the volume are those contained in a paper by Drs. Jæger and Diesselhorst on the thermal and electric conductivities, the specific heats and thermo-electromotive forces of certain metals.

When a current passes through a conductor it is heated; when, however, a stationary state is reached, the distribution both of current and of temperature does not change with the time. The conditions for this involve the ratio between the electric and thermal conductivities of the material, and Kohlrausch showed how this ratio might be readily determined by observations on the temperature and potential of three points of a conductor carrying a constant current, provided the ends of the conductor be maintained at a constant temperature.

The theory and the experimental details are both fully given in the paper; the temperatures were determined by the aid of very small thermal elements. The bars of metal experimented on were in most cases about 27 cm. in length, and from 1 to 2 cm. in diameter. The metals examined included gold, silver and platinum, while bars of rhodium and iridium, weighing respectively about ·75 and 1·33 kilogrammes, were prepared by Herr Heræus, but could not be used because of their extreme hardness.

In addition to determining the electric and thermal conductivities at 18° and at 100° C., the specific heats at these two temperatures and their thermo-electromotive forces as against copper were also determined.

Attention had been called by Wiedemann and Franz, in 1853, to the fact that the electrical and thermal conductivities of many substances are approximately proportional, and L. Lorenz, in 1881, had shown that the ratio of the thermal to the electric conductivities at various temperatures is approximately proportional to the absolute temperature. The experiments here described enable us to test these laws. The ratio is shown not to be accurately a constant, it varies in the case of the materials tested, excluding constantan, from 636 for aluminium to 964 for bismuth, but in far the greater number of cases its value lies between 670 and 800, a striking result when it is recollected that the electric conductivities vary between 5 and 60. The temperature coefficient of the ratio ranges, omitting bismuth and one or two high resistance alloys such as constantan and manganin, from ·034 to ·046; if the Lorenz law were true it would be ·0366 in all cases.

Sufficient, perhaps, has been said to indicate the importance of the volume and the high value of the researches which continue to be carried on at the Reichsanstalt.

MEDIÆVAL NATURAL HISTORY IN POLAND.[1]

THERE are few more interesting occupations than to trace the growth of scientific knowledge in the field of natural history. We are heirs of the labours of our forefathers, who were fain to struggle through obscure and devious paths to build up the mass of information on these subjects with which we are furnished. We find them living in a wonderland of the strangest credulity and superstition, and their errors have only gradually disappeared in the process of scientific investigation. With herbs, animals and precious stones were connected the wildest theories. Folk-lore played a busy part; the mandrake uttered groans when it was pulled up; the toad had a jewel in its head; the barnacle was half herb and half animal, and the barometz was a lamb which partook of a vegetable

[1] "Symbola ad historiam naturalem medii ævi. Średniowieczna Historya Naturalna. Systematyczne zestawienie roślin, zwierząt, mineralow oraz wszystkich innego rodzaju, lekow prostych, używanych w Polsce od xii do xvi w. przez Józefa Rostafinskiego." ("Mediæval Natural History. A systematic account of the plants, animals, minerals and all kinds of simple herbs known in Poland from the twelfth to the sixteenth century." By Joseph Rostafinski. (Cracow: University Press.)

nature. These beliefs have slowly died out, but Sir Thomas Browne, who lived so recently as the latter part of the seventeenth century, in his *Pseudodoxia Epidemica* wrote a book against the delusions of his countrymen, himself believing in many absurdities. The medicinal uses to which animals and herbs were applied strike us forcibly in these modern times. The scientific medical man of the nineteenth century was to be slowly evolved out of the medicine-man and conjurer. Nor are the two last entirely gone; they still may be found in the less civilised parts of Europe and in the more unfrequented nooks of our own country. We have no space to enumerate here the old works treating of popular therapeutics in England, such as the Anglo-Saxon medical books edited by the late Oswald Cockayne, in 1864, under the fantastic title, "Leechcraft and Wortcunning." The late Mr. Mowat, of Oxford, published two contributions on the subject in his *Alphita* and *Sinonoma Bartholomaei*. Many other works could be cited in English literature, but the immediate object of our article is to call the attention of our readers to the two volumes which have appeared from the pen of Mr. Joseph Rostafinski, professor of botany in the University of Cracow, and the title of which is given at the foot of p. 615. Prof. Rostafinski has furnished lists of the names of plants, animals, minerals and various kinds of herbs which were known in Poland from the twelfth to the sixteenth century. The greater part of these names are preserved in manuscript vocabularies in the libraries of Cracow (especially the so-called Jagiellon), Lemberg, Prague and St. Petersburg. Some of these vocabularies first became known in the pages of the Warsaw review, *Prace Filologiczne*, to which they were contributed by Prof. Brückner, of Berlin, one of the foremost Polish scholars.

For the botanist and student of natural history, these volumes have much value. Prof. Rostafinski catalogues the names of the plants, &c., upon a carefully-arranged system; compares the different names under which they are found, and gives us the Latin equivalents, which will help us in our search for them. He shows us where information has been gathered from Pliny and Dioscorides. His notes abound with folk-lore, and most people know how interesting folk-medicine is. Thus, of the herb koniochrom (*Hippocrepis comosa*, *L.*) we are told that it has this name (lit., making a horse lame) because if a horse treads upon it his shoe will fall off. The Slavonic appellation for the linden, or lime-tree, is lipa, and comes up in the original Slavonic name for Leipzig, Lipsk. On p. 443, vol. i., we get interesting details of the auerochs, of which a picture is given in Hartknoch's quaint old book on Prussia. It has now been almost exterminated, and is only found in some forests of Lithuania, where it is preserved for the Emperor's hunting. It is singular that in the sixteenth century camels were used in Poland; thus we find them employed in the time of Sigismund Augustus, when that monarch was journeying from Cracow to Wilno. The Slavonic name for camel is derived from the Gothic word ulbandus, which is really a very ancient adaptation of the Greek ἐλέφας.

One of the most curious parts of this interesting book is where the writer deals with the fabulous animals, basilisks, &c. The folk-lore connected with these is abundant. We are reminded of the work of our own countryman, Topsell. In fact, we have a good account of the flora, fauna and minerals, how they were called and what was known of them in Poland during the Middle Ages. Although the scope of the work is in a way limited to Poland, yet, as the author says in his introduction, which appears in Latin as well as in Polish, the book will be serviceable for north Europe generally. There is in reality a great unanimity in many of these legends about plants and animals. Pliny leads off, we may say, in his "Natural History," which was the great storehouse during the Middle Ages for folk-lore of all kinds. We must not forget, also, Bartholomæus' "De Proprietatibus Rerum," *c.* 1400. The Slavonic riches are being gradually collected; much has been already done in Russian, and the late Mr. Ralston made use of it in his books of Russian folk-songs and Russian folk-tales. The *Sbornik*, or *Miscellany*, published yearly by the Bulgarian Government, generally devotes a section of each new volume to these popular traditions. In England we have no special organ, except it be the *Folk-lore Journal*; our popular superstitions must be gathered from the miscellaneous pages of *Notes and Queries* and such books as "Gerard's Herbal." No little light is afforded by the curious medical works published in the sixteenth and seventeenth centuries, among which may be expressly mentioned the "Breuyary" of Andrew Borde and the choicely quaint work of Dr. Tobias Venner. In the life of Seth Ward, by Dr. Walter Pope, some extraordinary tales are told of a surgical operator of that time, and also in Aubrey's Lives.

In all countries the popular names given to plants may be said to be richly significant, and therefore not only the man of science, but the philologist may find much material in Prof. Rostafinski's volumes.

INTERNATIONAL ASSOCIATION OF ACADEMIES.

THE meetings of the International Association of Acadamies were concluded last Saturday, when it was determined unanimously that the next Congress should be held in London in 1904. Although the *Comptes rendus* of the various meetings have not yet been published, it is known that much useful work has been accomplished. Nothing could exceed the cordiality of the reception accorded to the foreign delegates by the French authorities and their scientific *confrères*. After the final meeting on Saturday, the delegates were received by the President of the Republic and Madame Loubet, and later in the day they attended a dinner and concert given in their honour at the Hôtel de Ville.

NOTES.

As already announced, a complimentary dinner to Sir Archibald Geikie will be given next Wednesday, May 1, at the Criterion Restaurant. A number of distinguished men of science will be present, and the chair will be occupied by Lord Avebury. It is felt that the retirement of Sir Archibald Geikie from the position of director-general of the Geological Survey should not be permitted to pass without an expression of appreciation of his services to science and to the nation. All who are able will, we are sure, show by their presence at the dinner that they delight to do honour to one who has worked so worthily and with such success for the extension of scientific knowledge. Tickets may be obtained from Mr. F. W. Rudler, 28, Jermyn Street, S.W.

WE regret to see the announcement of the death of Prof. H. A. Rowland, professor of physics at the Johns Hopkins University, Baltimore, U.S.A.

THE Australian mail brings us news that Messrs. Baldwin Spencer and Gillen left Adelaide on March 15 for their twelve months' North Australian expedition. Owing to the presence of drought in the interior, the start, which was to have been made early in February, had to be delayed. The original intention of the explorers was to have worked out through the McDonnell Range and the Arunta tribes, and then north, until the mouth of either the Daly or Victoria river was reached; but it seems likely that this course might have to be given up in preference for an inverse one starting from Port Darwin,